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United States Department of Agriculture,  
BUREAU OF PLANT INDUSTRY,

Office of Farm Management,  
WASHINGTON, D. C.

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HINTS TO SETTLERS ON THE SUN RIVER PROJECT,  
MONTANA.

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**DESCRIPTION OF THE REGION.**

The Sun River Project is located a little west of the center of Montana, on the eastern slope of the Rocky Mountains and near Great Falls, one of the largest cities in the State. Sun River Valley is about seventy miles long and from one to five miles wide. The ultimate development of the Project involves the reclamation of 256,000 acres of land. A compact body of 17,000 acres, known as the Fort Shaw Unit, has been opened to settlement. The farm unit is from 40 to 80 acres of irrigable land. These farms are obtained by homestead entry, and in addition to the small filing fee the settler is required to pay his pro-rata share of the cost of building the irrigation system. On the Sun River Project this amounts to \$30 per acre, payable in not more than ten annual installments, without interest. In addition there is an annual charge of 50 cents per acre for operation and maintenance. One-tenth of the building charge and one year's maintenance and operation fee, or \$3.50 per acre, become due at the time of making entry.

Model rural villages are being established at intervals of six miles, so that no farm will be more than three miles from a post-office. The lands are tributary to the Great Northern Railway. The principal crops will be alfalfa, wheat, oats, sugar beets, potatoes, and other vegetables. Good grazing lands surround the Project.

The most important problem of the settler on this Project is the planning of his irrigation system, as much of his future success will depend on a proper arrangement of the irrigation ditches. These should be arranged so there will be the least possible waste of water and so that irrigation may be carried on with a minimum amount of time and labor. For those who are unfamiliar with irrigation systems, Farmers' Bulletins 158, "How to Build Small Irrigation Ditches," and 263, "Information for Beginners in Irrigation," are especially recommended.<sup>1</sup>

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<sup>1</sup> These bulletins may be obtained free of charge upon application to the Secretary of Agriculture, Washington, D. C.

## LOCATION OF THE FARM BUILDINGS.

As the future health of the family is the first consideration, the house should, if possible, be located on high ground, so that water from irrigation will not settle around it. As the eastern exposure is the most pleasant the house should face that direction wherever practicable. The remaining farm buildings should be placed so as to be easily accessible to the house. As the prevailing direction of the wind is from the southwest the barn and other buildings should be so located with reference to the house that sparks can not be blown toward the barn or stacks, while odors from the barn will not be carried toward the house.

## THE GARDEN.

As soon as the location of the farm buildings is planned the settler should select a site for his garden. This should be as near the house as possible and in a place where it can be easily irrigated. The garden will be of the greatest importance to the new settler, as it can be made to furnish many of the table supplies and thus greatly reduce the living expenses.

Much care should be taken in the preparation of the soil. If possible, the ground should be broken to a depth of  $3\frac{1}{2}$  to 4 inches the previous year. It should again be plowed to a depth of 7 to 8 inches. In case the work is not begun until spring, the ground should be broken about 5 inches deep and the sod should be thoroughly pulverized with a disk or cut-away harrow. The ground should then be well irrigated and again harrowed. It is essential that the land be irrigated before planting. If the irrigation is done afterwards the water will wash the soil from the seed and much of the seed will be lost. In planting on nearly level ground the rows should follow the slope of the ground, so that a small stream of water can be run between every two rows. If the ground slopes very rapidly, the rows should run diagonally to the slope in order to prevent a too rapid flow of water, which would cause washing of the land.

Practically all of the common vegetables can be grown successfully. While the seasons vary in different years, early potatoes and peas should ordinarily be in the ground by the first of April. Potatoes planted at this time will be ready for the table about the first of July. Parsnips, carrots, beets, and onions should be planted as early in April as the weather permits. Beans, cucumbers, and squashes may be planted early in May, and sweet corn from the first to the middle of the month. Lettuce and radishes can be planted from the first of April on through the season as wanted. Tomatoes should be started in the house early in March, and transplanted in the garden as soon as the plants are large enough. Early cabbage and cauliflower can be sown in rows early in April and transplanted later, or they can be started earlier in the house or in a hot frame. Late cabbage can be sown the first week in May and transplanted up to the middle of July.



### THE ORCHARD.

The size of the orchard will depend largely upon the individual taste and plans of the settler, but everyone should have a small orchard of at least one-half acre in which the standard varieties of fruit are grown for home use. If possible, a northern slope should be selected. As this slope does not receive the rays of the sun as directly as those facing other directions it is much cooler, especially during those seasons of warm weather that frequently occur in January and February. At times the weather in these months is sufficiently warm to cause trees to start budding before the danger of heavy frosts is over.

The trees and shrubs should be purchased only in northern nurseries which grow their own stock. The following varieties of apples are suggested by the residents of this vicinity: Oldenburg (syn., *Duchess of Oldenburg*), Yellow Transparent, Patten (syn., *Patten Greening*), McIntosh (syn., *McIntosh Red*), and Gano. Among the crab apples Transcendent Whitney and Grant (syn., *General Grant*) are considered satisfactory. In growing plums, the Surprise, Wolf, and Wyant have been found suitable to the climate.

The small fruits, such as gooseberries, currants, and strawberries, also do well. The Glen Mary and Senator Dunlap have been found to be good market varieties of strawberries.

The land should be as thoroughly prepared as though the ground were to be used for a garden. The trees and small fruits should be set out as early in the spring as the weather permits. The same general rules used in setting out trees and small fruits in other regions will apply to the Sun River Project. During the first few years potatoes, beans, and other cultivated crops can be grown between the rows of young trees, and thus much space can be saved.

### WIND-BREAKS.

Unless timber is already growing on the place it is advisable for the settler to set out shade trees and wind-breaks as soon as he can. The earlier this is done the sooner he will be provided with shade and shelter. In this region wind-breaks are considered necessary for the protection of orchards. It is customary to place them on the west side of the orchard, setting out 3 or 4 rows of trees near enough to protect it from the wind. The best tree for this purpose is a broad-leaved cottonwood, which is a native of this region. It grows rapidly and is very hardy. These trees form excellent shelter for the orchard. Golden willows, which grow from cuttings, also make good wind-breaks and can be used as hedges or as individual trees. Ash, elm, and maple are also being set out for this purpose, but being hardwood trees they grow much more slowly.

### HAY CROP.

In order to secure hay enough to last through the first year the settler should reserve a part of the natural grass on the farm and irrigate

it thoroughly. This grass will respond wonderfully to irrigation and will provide an excellent quality of feed for winter use at very little expense.

### GRAIN GROWING.

Grain can be grown very successfully. It should be made to bring in some revenue the first year. While grain will be an excellent crop to grow on new ground for the first one or two years, the irrigation farmer should not take up that type of farming exclusively. After he has his farm thoroughly established grain should be grown only in rotation, and used as a crop to precede alfalfa. Wheat, barley, and oats will all grow in this vicinity and will find a ready market. The Swedish Select and Progress will be the best varieties of oats. The Chevalier and the beardless hull-less varieties of barley are recommended. Turkey Red and Winter Fife are the best winter wheats, while Scottish Fife will probably be found best for spring seeding.

In case the farmer has not sufficient wild hay the first year he can cut some of his grain for that purpose. If the grain is cut just in the milk stage it will make an excellent quality of hay. Care should be taken not to let it get too ripe, or its value for hay will be greatly decreased. Either oats or emmer (improperly called spelt) make a very good quality of hay. Beardless barley is also well adapted for this purpose and gives a good yield. It can be planted as late as July 1 and still yield a good crop of hay. If allowed to ripen, the grain from beardless barley makes an excellent feed for hogs, but when used for this purpose should be ground or rolled. This grain and alfalfa make an excellent combination for fattening hogs. Canada field peas should also grow well in this region. They can be used as hay or grain and make excellent feed for hogs or sheep. Corn is grown but very little in the district. The best success seems to have been obtained with Northwestern Dent from seed secured in the Dakotas.

Although better yields are obtained where the ground has been broken in the spring and then replowed, nevertheless paying crops can be secured on new breaking. In preparing new ground for grain it should be broken about 5 inches deep, the breaking to be done with a mold-board plow which turns the sod clear over. The sod will rot much better than when only partly turned, as the disk plow would leave it. The running of a heavy drag or roller over the land will compact the soil and greatly help the rotting process. The sod should be thoroughly pulverized with a disk harrow, or, better, with a cut-away harrow, and then smoothed with a drag harrow. The ground should then be thoroughly irrigated. If the soil is a sandy loam or a loam, a harrow should immediately follow the irrigation. If it is a clay soil and inclined to be sticky, the harrow should follow the instant the soil is dried out sufficiently so that there will be no danger of puddling.



### ALFALFA.

Alfalfa should form one of the leading crops, if not the main crop of the farm, and should be one of the first crops put in. The best results will be obtained where the alfalfa has been seeded on ground that has been in cultivation for one or more years. If, however, the settler desires to start with a small acreage of alfalfa the first year this may be done with a fair degree of success on new breaking. Such a field will not be permanent, as the stand will not be so good as on older ground, while the bluejoint and other native grasses will ultimately take possession.

The ground should be as carefully prepared as though it were to be used for garden purposes. The most essential feature in starting this crop is that the soil shall be in a perfect state of tilth. In case the farmer should have any barnyard manure on hand a liberal coating thoroughly harrowed in would greatly increase the probabilities of success. The alfalfa should be seeded about the middle of May, or as near that time as possible, although under irrigation it can be put in much later with perfect safety. Ordinarily it should be seeded at the rate of about 15 pounds to the acre, but on new breaking it might be well to use from 18 to 20 pounds.

Alfalfa will yield only a very small crop the first year. It should not be pastured until the field is two or three years old. Alfalfa may be used very successfully for pasturing hogs and horses, but is not to be recommended for sheep or cattle. When sheep and cattle are pastured on alfalfa there is always danger of loss from bloat. Dairy stock do fully as well on alfalfa hay as on alfalfa pasture, while the danger of bloat is avoided. There are many successful dairies in irrigation districts where the cows are fed nothing but alfalfa hay, although sometimes a little grain is added. A general discussion of this crop that will be helpful to those persons unfamiliar with it is given in Farmers' Bulletin 339.<sup>1</sup>

### TYPES OF FARMING.

The man of limited capital should not go to too great an expense in laying out his farmstead. He should try to keep within his means and develop the place gradually. In addition to his team of horses he should by all means own one cow, one or more pigs, and some chickens. As dairy cows are scarce in Montana the newcomer would probably find it well to bring the cows he needs with him. This live stock, together with his garden, will supply the new settler with nearly all the provisions he will need, and can be made to furnish a surplus that may be traded for groceries.

A number of different types of farming will be possible on this Project. Those types that will prove the most successful over a period of years

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<sup>1</sup> This bulletin may be obtained free of charge upon application to the Secretary of Agriculture, Washington, D. C.

will be the ones which provide for the feeding of the greater part of the farm produce to live stock. This is partly because this region is well adapted to live-stock farming and partly because of the necessity of providing manure for the farm if it is to be maintained at its highest earning capacity. Nearly all western soils are very rich in mineral matter, but considerable humus must be added if they are to reach their fullest capabilities. This can be supplied either by growing cover crops to be turned under as green manure or by the use of barnyard manure. Among the most prosperous farming regions in the United States are the irrigation districts in Colorado where sugar-beet growing is extensively carried on. In these regions thousands of sheep are fed annually, not only for the reason that sheep feeding is a profitable business, but because by feeding sheep farmers can keep all their alfalfa on their farms and have a large quantity of manure available for use. Those who do not feed sheep purchase their manure, as they have found by experience that they must do so if they are to continue getting large yields.

Dairying is the more common form of live-stock business for the small farm and should be made one of the leading industries of this Project. The farmer can either make his own butter or sell cream at the creameries. In connection with dairying the farmer can very profitably raise a number of pigs. With skim milk, alfalfa, and barley for grain in finishing, the farm will be able to produce a high grade of pork. Hog raising will also prove a very profitable type of farming, as alfalfa and barley, two of the best crops that can be found for feeding hogs, can be readily grown in this region.

The winter feeding of cattle and sheep should also prove a very profitable business. With the large number of live stock that range in the near-by mountains during the summer months there will be a ready market for all the forage that can be raised. This should be fed on the place in order that it may be returned to the land in the form of manure.

#### **ROTATIONS.**

At the present time no special rotations can be suggested for the region. Alfalfa should be the leading crop. This may be broken up occasionally and a crop or two of grain be grown. If the farmer is desirous of growing potatoes, an excellent rotation would be to plow the alfalfa, grow the potatoes for one year or two years, follow by grain one or perhaps two years, and back to alfalfa. In case a sugar-beet factory should be located near enough to make it profitable to grow beets, no better rotation could be found than the one used in the Greeley and Fort Collins district of Colorado. This is as follows: Alfalfa, beets 2 years, grain 1 year, alfalfa 2 or 3 years, and back to beets.

It is difficult to grow beets after alfalfa on account of the alfalfa roots interfering with the machinery used in cultivation. This may be over-



come by replacing one of the beet crops by potatoes or by growing grain before the beets are put in instead of afterwards. After alfalfa has been grown for a number of years the grain following this crop sometimes lodges. When this difficulty occurs the beets can follow the alfalfa directly if the alfalfa roots are raked out before the beets are planted, although this increases the expense of raising the beet crop.

Further information on specific questions that may arise in the development of the farm may be obtained by addressing the Secretary of Agriculture, Washington, D. C., the Director of the Montana Agricultural Experiment Station, Bozeman, Mont., or the Secretary of the Board of Commerce, Great Falls, Mont. All the particulars desired concerning the water-right charges and details of operation on the Project may be obtained from the Project Engineer at Fort Shaw, Mont.

### SUMMARY.

(1) Much of the settler's future success will depend on the proper arrangement of the irrigation system.

(2) The house should be located on high ground. The other buildings should be easily accessible.

(3) The garden will be of great importance. Care should be taken in its preparation. All of the more common vegetables can be grown.

(4) Everyone should have a small orchard in which standard varieties of fruit are grown for home use.

(5) Wind-breaks are considered advisable, especially where there are orchards.

(6) Grain can be grown successfully, but should be used only in rotation with other crops, especially alfalfa.

(7) Alfalfa should be one of the leading crops, if not the main crop.

(8) The most successful types of farming will be those where the bulk of the crops is fed to some form of live stock, partly because the country is naturally adapted to live-stock farming and partly because of the necessity of providing manure.

(9) Dairying will be the more common type of live-stock farming. Hog raising and winter feeding of sheep and cattle should also be profitable.

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